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Bibliography

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Summary

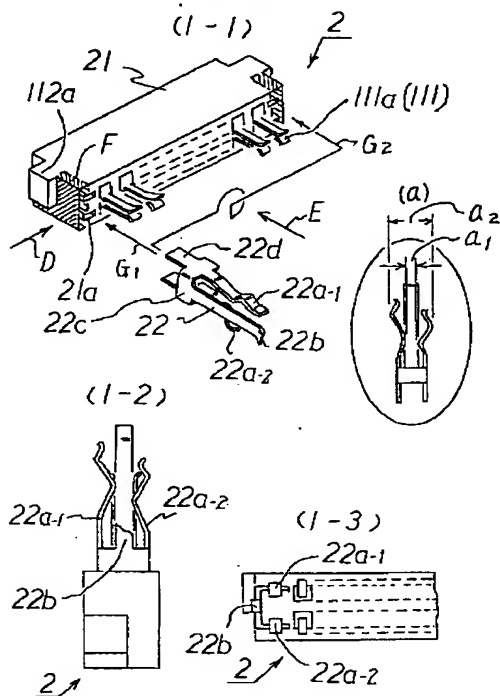
(57) [Abstract]

[Objects of the Invention] It aims at realizing this substrate positioning at the time of circuit board connection, and easy-ization of a grounding short circuit, and aiming at improvement in productivity about the connector for circuit board connection.

[Elements of the Invention] The jack terminal which uses as an end contact lead 111a connected to the electrode of the circuit board It is the connector for circuit board connection which it comes to implant in an insulator 21 in the field except this lead 111a. Near the longitudinal direction both ends by the side of the area outside contact lead arrangement of the contact lead-projection side of an insulator 21 the 1st tongue-shaped piece of the couple which meets where it has the Yamagata salient which can be displaced in the opening direction by contact to the aforementioned circuit board side The 2nd tongue-shaped piece 22b which can specify the crosswise position of this circuit board by contact to 22a-1, 22a-2, and electrode formation ***** of the aforementioned circuit board The positioning earth terminal 22 bent and fabricated so that it might become a "KO" typeface when it saw from a nose of cam is the 2nd tongue-shaped piece 22b. It implants and constitutes so that a ** "KO" typeface may meet with the interval maintained which can contact electrode formation ***** of the above-mentioned circuit board.

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本発明になるコネクタを主要部を中心として説明する図



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CLAIMS

[Claim(s)]

[Claim 1] The jack terminal which uses as an end the contact lead connected to the electrode which aligned at **** of the circuit board and has been arranged It is the connector for circuit board connection which it comes to implant in an insulator. near the longitudinal direction both ends by the side of the area outside contact lead arrangement of the contact lead-projection side of the aforementioned insulator The positioning earth terminal by which the 2nd tongue-shaped piece which can specify

the crosswise position of this circuit board was really fabricated by contact to the 1st tongue-shaped piece of a couple and electrode formation ***** of the aforementioned circuit board which meet where it has the Yamagata salient which can be displaced in the opening direction by contact to the aforementioned circuit board side The connector for circuit board connection characterized by being implanted, respectively.

[Claim 2] The 2nd tongue-shaped piece which can specify the crosswise position of this circuit board by contact to the 1st tongue-shaped piece of a couple and electrode formation ***** of the aforementioned circuit board which meet in the state where it is characterized by providing the following The positioning earth terminal bent and fabricated so that it might become a "KO" typeface when it saw from a nose of cam It is implanted and constituted so that a ** "KO" typeface may meet, while the 2nd tongue-shaped piece had maintained the interval which can contact electrode formation ***** of the above-mentioned circuit board. Memory card characterized by for the above-mentioned circuit board before connecting with a connector equipping the field in contact with the 1st tongue-shaped piece of the above-mentioned connector with the grounding pattern connected with the circuit on this circuit board, and forming it in it The circuit board connected to the connector The case of the plane view "KO" typeface positioned and held so that a connector can connect with an external device on this connector by which connection unification was carried out, the salient which prepared the circuit board in the connector, and the outskirts of the circuit board It is the memory card which contains at least the shield board with which these case both sides are equipped. The above-mentioned connector before the circuit board connection which comes to implant in an insulator the jack terminal which uses as an end the contact lead connected to the electrode which aligned at **** of the circuit board and has been arranged in the field except this contact lead The Yamagata salient which displaces in the opening direction by contact to the above-mentioned circuit board side, and can contact the aforementioned shield board near the longitudinal direction both ends by the side of the area outside contact lead arrangement of the contact lead-projection side of an insulator

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the connector for circuit board connection and memory card which started the composition of the connector for circuit board connection equipped with the terminal for grounding, and the composition of the memory card using this connector, especially realized simultaneously easy-izing of this substrate positioning at the time of the circuit board connection to a connector, and certain-ization of the grounding short circuit as memory card, and aimed at improvement in productivity by the formation of assembly easy.

[0002] The memory card which can be detached and attached on these terminal equipments and main parts of equipment as one means to exchange the information between a terminal equipment and the main part of equipment with progress of electronic technology is spreading.

[0003] and in this memory card in this case Although the connector for required shell circuit board connection (it only considers as a connector in a sentence below) which makes the above-mentioned terminal equipment and the main part of equipment detach and attach the circuit board which two or more semiconductor devices, such as memory, and electron devices are mounted, and is arranged in this memory card is used It has been a big technical problem from the assembly operation as memory card taking parts special to grounding of this things and memory card faceplate to a man day how productivity is raised.

[0004]

[Description of the Prior Art] Drawing 6 is drawing which explains the conventional connector with the composition of memory card, and (6-1) shows the composition as memory card. (6-2) The principal part concerning this invention of a connector, i.e., the dashed line region of drawing, is seen and shown from **** A.

[0005] Moreover, drawing 7 is drawing explaining a trouble. Drawing 6 (6-1) Memory card 1 Connector 11, The circuit board 12 connected to this connector 11 where two or more semiconductor devices, such as memory, and electron devices are mounted, and this connector 11 and the circuit board 12 after carrying out connection unification are positioned. The plurality which is made to flow through between this circuit board 12, two shield boards 14-1, and 14-2 in the shield board 14-1 fixed to thickness direction both sides of a case 13 and this case 13 to hold with meanses, such as adhesion, 14-2, and the state where it was included in the above-mentioned circuit board 12, and is connected with grounding potential too

hastily It is constituted from the coil spring 15 for grounding of four-piece) by the case of (drawing.

[0006] the jack contact which can fit into the plug terminal connected with the terminal equipment to which the end mentioned this inner connector 11 above, or the main part of equipment and which is not illustrated — the other end (6-2) Two or more jack terminals 111 currently formed in shown tongue-shaped contact lead 111a Insulator 112 currently formed so that it may align at the arrangement based on the specification of Japan Electronic Industry Development Association (JEIDA) etc. and maintenance fixation can be carried out in the field excluding the above-mentioned contact lead 111a in each ***** 111 It is constituted. The above-mentioned jack terminal 111 This insulator 112 An insertion point arrangement can be carried out and the connector 11 of illustration can be assembled by carrying out maintenance fixation.

[0007] Moreover, drawing (6-1) Pad electrode 121 connected with the circuit in which it is not illustrated on this substrate in each position which corresponds to a connection with the connector 11 of the circuit board 12 with each above-mentioned contact lead 111a Pattern formation is carried out.

[0008] The case 13 which, on the other hand, makes a plane view "KO" typeface In the inside near [the] the opening side edge section, it is the above-mentioned insulator 112. Depression 13a which fits into longitudinal direction both ends with salient 112a which projects in a longitudinal direction, and can be positioned While having Salient 13b for holding the above-mentioned circuit board 12 by two or more places of the circumference of it to the peripheral wall inside It is what is had and formed. It is above-mentioned depression 13a about the above-mentioned connector 11 and the circuit board 12 which carried out connection unification.

Salient 13b Positioning maintenance can be collectively carried out now.

[0009] In addition, the coil spring 15 for grounding mentioned above enlarged view in a circle (a) Grounding pattern 122 connected with the circuit on this substrate in each middle region near [two or more] the circumference of the above-mentioned circuit board 12 (drawing four places) so that it may be shown the half-ellipse depression currently had and formed — a hole — by inserting in 12a like **** B It can be made to hold to this substrate 12 in the state where it was made to connect with the grounding potential of this circuit board 12 too hastily.

[0010] Then, drawing (6-2) The circuit board 12 is inserted in the contact lead 111a side of a connector 11 like Arrow C. After carrying out the soldered joint of each contact lead 111a and each pad electrode 121 corresponding to it, each ***** depression of the circuit board 12 — hole 12a This connector 11 and the circuit board 12 are made to position and hold to the above-mentioned case 13 in the state where the coil spring 15 was made to hold. Furthermore, the two above-mentioned shield boards 14-1 and 14-2 are fixed to this case 13, and it is made to constitute the necessary memory card 1.

[0011] In the memory card which becomes this composition, since the connector

and the circuit board which were unified only by removing a shield board can detach and attach from a case, there is a merit easily changed also into memory card with what property.

[0012]

[Problem(s) to be Solved by the Invention] However, the miniaturization of a contact lead and small pitch-ization are increasingly desired by the miniaturization demand as a customer's memory card, the increase demand in a terminal accompanying use expansion, etc.

[0013] drawing 7 (a) the connector 11 and the circuit board 12 before unification — drawing 6 (b) ** — drawing shown similarly — it is — drawing 7 (b) It is drawing having shown the poor state. Drawing 7 (a) It is (b) when the circuit board 12 is inserted in the contact lead 111a side of a connector 11 like Arrow C. It is the pad electrode 121 of contact lead 111a and the circuit board 12 so that it may be shown. Position gap may occur in between.

[0014] And this position gap in this case makes induction of the short circuit during contiguity easy to carry out along with detailed-izing of the width of face w of contact lead 111a, or minute-izing of Pitch p. Therefore, in the connector which becomes the conventional composition, the alignment of both for making it unite with the circuit board was multiplied by many man days, and a colander was not obtained, but there was a problem said that the improvement in productivity from a man day-side is not expectable. Moreover, there was a problem referred to as that must equip with the coil spring 15 for the grounding short circuit between the circuit board and a shield board also at the time of the assembly as memory card, and a man day starts it.

[0015]

[Means for Solving the Problem] The jack terminal which uses as an end the contact lead connected to the electrode which aligned at **** of the circuit board and has been arranged the above-mentioned technical problem It is the connector for circuit board connection which it comes to implant in an insulator. near the longitudinal direction both ends by the side of the area outside contact lead arrangement of the contact lead-projection side of the aforementioned insulator The positioning earth terminal by which the 2nd tongue-shaped piece which can specify the crosswise position of this circuit board was really fabricated by contact to the 1st tongue-shaped piece of a couple and electrode formation ***** of the aforementioned circuit board which meet where it has the Yamagata salient which can be displaced in the opening direction by contact to the aforementioned circuit board side The connector for circuit board connection currently implanted, respectively is solved.

[0016] Moreover, the case of the plane view "KO" typeface positioned and held so that a connector can connect with an external device on the circuit board connected to the connector, this connector by which connection unification was carried out and the salient which prepared the circuit board in the connector, and the outskirts of the circuit board, It is the memory card which contains at least the

shield board with which these case both sides are equipped. The above-mentioned connector before the circuit board connection which comes to implant in an insulator the jack terminal which uses as an end the contact lead connected to the electrode which aligned at **** of the circuit board and has been arranged in the field except this contact lead Near the longitudinal direction both ends by the side of the area outside contact lead arrangement of the contact lead-projection side of an insulator The 2nd tongue-shaped piece which can specify the crosswise position of this circuit board by contact to the 1st tongue-shaped piece of a couple and electrode formation ***** of the aforementioned circuit board which meet where it has the Yamagata salient which displaces in the opening direction by contact to the above-mentioned circuit board side, and can contact the aforementioned shield board The positioning earth terminal bent and fabricated so that it might become a "KO" typeface when it saw from a nose of cam It is implanted and constituted so that a ** "KO" typeface may meet, while the 2nd tongue-shaped piece had maintained the interval which can contact electrode formation ***** of the above-mentioned circuit board. The above-mentioned circuit board before connecting with a connector is attained by the memory card which equips the field in contact with the 1st tongue-shaped piece of the above-mentioned connector with the grounding pattern connected with the circuit on this circuit board, and is formed in it.

[0017]

[Function] If the terminal for grounding which has a tongue-shaped piece for circuit board positioning and a tongue-shaped piece for the short circuit between shield boards in the contact lead side edge side of a connector is added, circuit board positioning and the short circuit between shield boards are simultaneously realizable.

[0018] Then, when the 1st two tongue-shaped piece and the 2nd one tongue-shaped piece which meet see from each point, two positioning earth terminals which carried out unification formation so that it might become a "KO" typeface are added near the longitudinal direction both ends of the contact lead side edge side of a connector so that the 2nd tongue-shaped piece may meet, and it is made to constitute a connector from this invention.

[0019] This shows that between these shield boards may short-circuit the 1st tongue-shaped piece interval as an object for the short circuit between shield boards by making it correspond to a shield board interval while positioning as the circuit board can realize these two positioning earth terminals by arranging to a connector so that the 2nd tongue-shaped piece interval as an object for circuit board positioning may be equivalent to the width of face of the circuit board.

[0020] Therefore, without using the coil spring used by drawing 6 , positioning of the circuit board to a connector and the short circuit between shield boards can be realized simultaneously, and improvement in productivity can be expected.

[0021]

[Example] Drawing 1 is drawing which explains the principal part for the connector which becomes this invention as a center, and drawing where (1-1) looked at the

state diagram under assembly, and (1-2) looked at the state after assembly from arrow D, and (1-3) are drawings which looked at the state after assembly from arrow E.

[0022] Moreover, drawing where drawing 2 explains the unification process of the connector of this invention and the circuit board, drawing where drawing 3 explains the example of formation of the positioning earth terminal which realizes this invention, drawing where drawing 4 explains the example of composition of memory card, and drawing 5 are drawings explaining other examples of composition of memory card.

[0023] In addition, it is omitted about the explanation which overlaps while giving the same sign to the same object member and same part as drawing 6, since the case where it is made to apply to the memory card which each explained by drawing 6 drawing is made into the example.

[0024] Drawing 1 (1-1) The connectors 2 which become this invention are two or more jack terminals 111 explained by drawing 6. Each of this terminal 111 It consists of an insulator 21 which aligns at predetermined arrangement and carries out maintenance fixation as drawing 6 explained, and two positioning earth terminals 22 which realize this invention.

[0025] And this insulator 21 in this case is the insulator 112 of drawing 6. Earth terminal fixed hole 21a of the size which can be fixed to the extended field by insertion of 22d of salients which mention the above-mentioned positioning earth terminal 22 later while making both sides extend the length of the portion except salient 112a in the height (for it to illustrate as a hatching field F drawing) which does not exceed this salient height It forms.

[0026] Moreover, the positioning earth terminal 22 is the 1st two tongue-shaped piece which meets. 22a-1, 22a-2, and one 2nd tongue-shaped piece 22b It is piece of connection 22c so that it may become a "KO" typeface, when it sees from each point. It is what bends and is fabricated in the state where it was connected. piece of connection 22c **** — hole 21a for positioning earth terminal wearing fixation of the above-mentioned insulator 21 insertion — this insulation — the inside of the body — 22d of salients fixed on core wire It is formed.

[0027] In addition 1st tongue-shaped piece of the above which changed each length in order to close wearing of the circuit board 12 in drawing 6, if easy 22a-1 Both 22a-2 are an extraction view in a circle (a). So that it may be shown From each base, it is bent and is formed in Yamagata which projects on the back outside once stir-fried in the inside, i.e., the direction approached mutually. In the early ordinary state, the summit-of-the-mountain interval a2 is set up so that the closest-approach interval a1 may become [interval / shield board /, i.e., the thickness of a case 13 near, / in drawing 6] again smaller at least than the thickness of the circuit board 12 of drawing 6.

[0028] Moreover, 2nd tongue-shaped piece 22b If a nose-of-cam region is easy in wearing of the above-mentioned circuit board 12, in order to close, it is bent outside.

22d of then, salients of each of these two positioning earth terminals 22 It is each earth terminal fixed hole 21a of the above-mentioned insulator 21 like arrows G1 and G2. Insert, and if it fixes the 1st tongue-shaped piece 22a-1, 22a-2, and the 2nd tongue-shaped piece 22b Arranged connector 2 (1-2) And (1-3) Although it can constitute so that it may be shown The 2nd tongue-shaped piece 22b which meets by these two positioning earth terminals 22 at this time The crosswise position of the circuit board will be regulated and the 1st tongue-shaped piece 22a-1 and 22a-2 will regulate the thickness direction of the circuit board.

[0029] drawing 2 (2-1) which shows the process which connects the circuit board to the connector of drawing 1 The state (2-2) where it dissociated before connection, the state in the middle of connection — moreover (2-3) The state after connection is shown, respectively.

[0030] Drawing (2-1) The circuit board 25 corresponding to the connector 2 explained by drawing 1 is each pad electrode 121, although it is the circuit board 12 and the equal which were explained by drawing 6 . Crosswise both side side side 25b of an arrangement region Grounding pattern 25a connected with near in a ground circuit It is formed in addition.

[0031] Then, if this circuit board 25 is made to correspond with each contact lead 111a of the above-mentioned connector 2 and is made to approach like Arrow C, it is the 2nd long tongue-shaped piece 22b of the positioning earth terminal 22. It is both-sides side 25b of this substrate 25 first. Although it contacts and the crosswise positioning is realized This is each pad electrode 121 of this substrate 25. While it is shown that alignment of each contact lead 111a of a connector 2 is carried out, it is grounding pattern 25a of this substrate 25. The 1st tongue-shaped piece of a connector 2 It means that 22a-1 and 22a-2 contact.

[0032] When this circuit board 25 is pushed in further, as the 1st tongue-shaped piece 22a-1 of the above-mentioned positioning earth terminal 22 and the closest-approach interval a1 between a-222 explained by drawing 1 , then, since it is smaller than the thickness of this substrate 25, The pad forming face of this substrate 25 is this tongue-shaped piece. 22a-1 Although 22a-2 are contacted one by one and a variation rate is made to carry out outside This tongue-shaped piece Since it is set up so that it may become near the shield board interval of drawing 5 as the summit-of-the-mountain interval a2 in the ordinary state of the first stage between 22a-1 and a-222 explained by drawing 1 , the summit-of-the-mountain interval a3 in this time will exceed the shield board interval shown with an alternate long and short dash line.

[0033] Drawing (2-2) The state at this time is shown. It pushes in until it stops this circuit board 25 after that (2-3). Although it will be in the state which shows The 1st tongue-shaped piece of the above Variation rate (2-2) of 22a-1 and 22a-2 Since a state is maintained mostly It is the contact lead 111 then. Pad electrode 121 The above-mentioned connector 2 and this circuit board 25 can be made to unify including ground connection by connecting both with the usual soldering technology

etc.

[0034] At especially this unification process, since alignment can be carried out only by insertion of this substrate 25, without carrying out alignment of a connector 2 and the circuit board 25, applying a man day, efficient unification work is realizable.

[0035] Drawing 3 explains the formation method of the positioning earth terminal 22 explained by drawing 1 and drawing 2 here. Drawing 3 which showed the blank configuration before terminal formation (3-1) Blank 22' which pierced and was fabricated with the usual press technology etc. from 22" of hoops connection section 22c in alignment with 22" of hoops 22d of two salients of one side which project in ** on the other hand 22d of this salient of each The 1st tongue-shaped piece which projects on another side from each corresponding position 22a-1 and 22a-2 — and — this — the 2nd tongue-shaped piece 22b which projects in this direction from between two tongue-shaped piece 22a-1 and 22a-2 It is connected and formed.

[0036] In addition, the 1st tongue-shaped piece in this case 22a-1, 22a-2, and the 2nd tongue-shaped piece 22b In order to attain wearing easy-ization of the circuit board 25 mentioned above, the 1st two tongue-shaped piece 22a-1 and 22a-2 — the one side — for example, — 22a-1 — another side while making it shorter than 22a-2 — the 2nd tongue-shaped piece 22b It is made to make it still longer than these 1st tongue-shaped pieces.

[0037] then, the usual bending technology — first — 1st tongue-shaped piece each of 22a-1 and 22a-2 — connection section 22c from — mountain fold of an angle suitable in each position of ** set up beforehand — ** ***** Mountain fold ***** is performed one by one. Moreover, 2nd tongue-shaped piece 22b It ***** at a suitable angle near [the] the nose of cam, and is connection section 22c further. The 1st tongue-shaped piece 22a-1 and the 2nd tongue-shaped piece 22b Between and this 2nd tongue-shaped piece 22b The 1st tongue-shaped piece It is carrying out mountain fold of between 22b-2 right-angled. Necessary positioning earth terminal 22 (4-2) explained by drawing 1 and drawing 2 It can obtain so that it may be shown.

[0038] It consists of a shield board 14-1 fixed to thickness direction both sides of a case 31 and this case 31 which position and hold the circuit board 25 which explained memory card 3 to be a connector 2 by drawing 2 by drawing 4 which gives instantiation explanation of the composition as memory card which used the connector 2 of drawing 1 , and this connector 2 and the circuit board 25 after carrying out connection unification with meanses, such as adhesion, and 14-2.

[0039] And the case 31 in this case is what makes a plane view "KO" typeface like the case 13 of drawing 6 . Salient 112a of the insulator 21 which constitutes the above-mentioned connector 2 in the inside near [the] the opening side edge section, and depression 13a which fits in Fluting presser-foot-stitch-tongue 31a which can be held across the circumference of the above-mentioned circuit board 25 in the thickness direction inside the center of a peripheral wall connection section simultaneously while having It is what is had and formed. It is above-

mentioned fluting presser-foot-stitch-tongue 31a like an arrow H1 about the nose-of-cam side edge side of the circuit board 25 by which connection unification is carried out at the above-mentioned connector 2. After making it insert, It is above-mentioned depression 13a of this case 31 about the above-mentioned salient 112a of a connector 2 like arrows H2 and H3. By dropping, positioning maintenance of this connector 2 and the circuit board 25 can be collectively carried out now.

[0040] Then, if two shield boards 14-1 and 14-2 are fixed to this case 31 like back drawing 6 which made the connector 2 by which connection unification is carried out, and the circuit board 25 hold to a case 31 by the above-mentioned method The 1st tongue-shaped piece as a connector 2 Since it is over the shield board interval as the summit-of-the-mountain interval a3 of 22a-1 and 22a-2 explained by drawing 2 , it is each of this 1st tongue-shaped piece. 22a-1 and 22a-2 will contact each above-mentioned shield board 14-1 and the inside of 14-2. It is the grounding pattern 122 of the circuit board 25 as a result. Each shield board 14-1 and the necessary memory card 3 which 14-2 short-circuited can be constituted.

[0041] In the memory card 3 which becomes this composition, since the coil spring 15 for grounding needed by the conventional memory card 1 is unnecessary, there is a merit which the number of erectors can cut down.

[0042] It consists of shield boards 14-1 fixed to the case 41 which memory card 4 positions a connector 2, the circuit board 25 and this connector 2 that carried out connection unification, and the circuit board 25 by drawing 5 which showed other examples of composition of memory card, and is held, and this case 41 with meanses, such as adhesion.

[0043] And especially this case 41 in this case is the case 411 corresponding to shield **** 14-1 by which wearing fixation is carried out at its case [which was explained by drawing 4] 31, and undersurface side. Shield board 412 For example, extracted enlarged view in a circle (a) It really fabricates in the state where it combined like, and forms in it.

[0044] Therefore, it is the grounding pattern 122 of the circuit board 25 like drawing 4 by carrying out wearing fixation of the shield board 14-1, after setting the connector 2 and the circuit board 25 by which connection unification was carried out to this case 41 like arrows H1-H3 like the case of drawing 4 . Each shield board 14-1 and the necessary memory card 4 which 14-2 short-circuited can be constituted.

[0045] In addition, even if it replaces with a plug connector the jack connector which becomes the above-mentioned explanation, deep ** constituted similarly is made. In the memory card 4 which becomes this composition, there is a merit assembled still more efficiently than the memory card 3 of drawing 4 .

[0046]

[Effect of the Invention] The connector for circuit board connection and memory card which realized simultaneously formation of positioning easy at the time of the circuit board connection to a connector and certain-ization of the grounding short

circuit as memory card, and aimed at improvement in productivity by the formation of assembly easy by this invention can be offered like ****.

[0047] moreover -- explanation of this invention -- pad electrode 121 of the circuit board both sides of this substrate -- it is -- contact lead 111 although the case where a soldered joint is carried out by both sides of this substrate is made into the example -- the above-mentioned pad electrode 121 it arranges on one side of this substrate -- having -- the above-mentioned contact lead 111 Even when connecting on one side of this substrate, what an equivalent effect is acquired for is clear.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing which explains the principal part for the connector which becomes this invention as a center.

[Drawing 2] Drawing explaining the unification process of the connector of this invention, and the circuit board.

[Drawing 3] Drawing explaining the example of formation of the positioning earth terminal which realizes this invention.

[Drawing 4] Drawing explaining the example of composition of memory card.

[Drawing 5] Drawing explaining other examples of composition of memory card.

[Drawing 6] Drawing which explains the conventional connector with the composition of memory card.

[Drawing 7] Drawing explaining a trouble.

[Description of Notations]

2 Connector for Circuit Board Connection

3 Four Memory card

13a Depression

14-1, 14-2, 412 Shield board

21 Insulator 21a Earth Terminal Fixed Hole
22" Hoop 22 ' Blank
22 Positioning Earth Terminal 22a, 22a-1, 22a-2 1st Tongue-shaped Piece
22b The 2nd tongue-shaped piece 22c Piece of connection
22d Salient
25 Circuit Board 25a Grounding Pattern
25b Side side
31 41,411 Case 31a Fluting presser foot stitch tongue
111 Jack Terminal 111a Contact Lead
112a Salient
121 Electrode (Pad Electrode)

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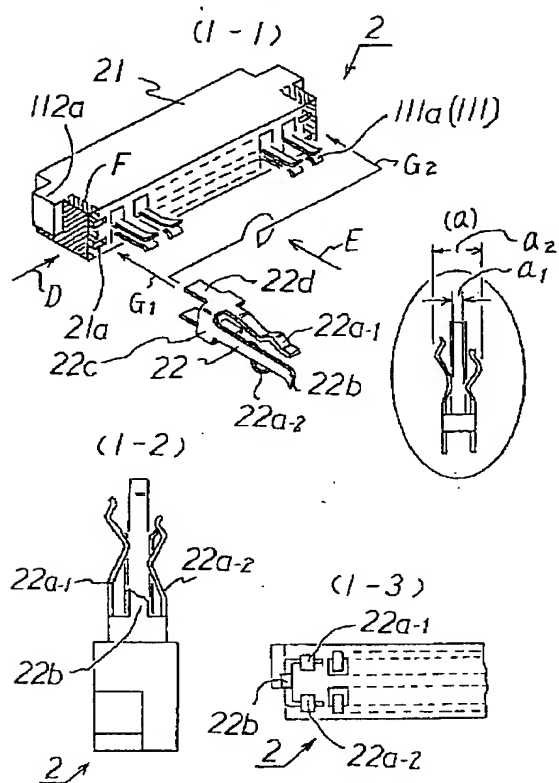
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DRAWINGS

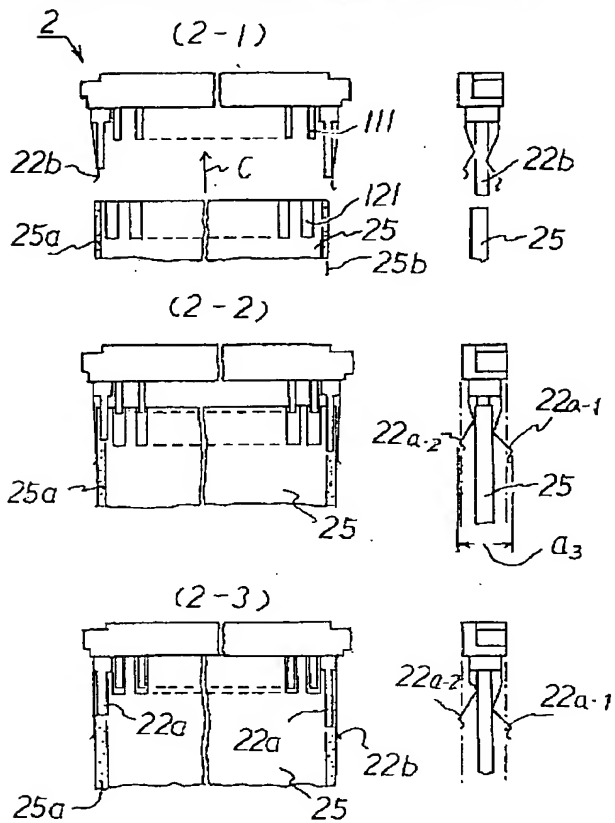
[Drawing 1]

本発明になるコネクタを主要部を中心として説明する図



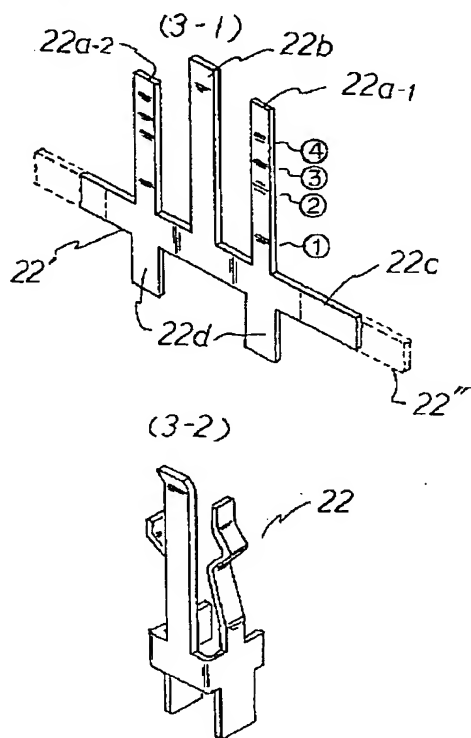
[Drawing 2]

本発明のコネクタと回路基板の一体化工程を説明する図



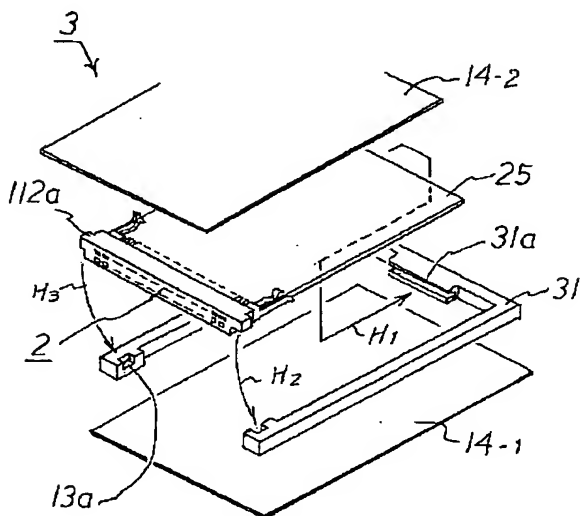
[Drawing 3]

本発明を実現する位置決め接地端子の形成例を説明する図



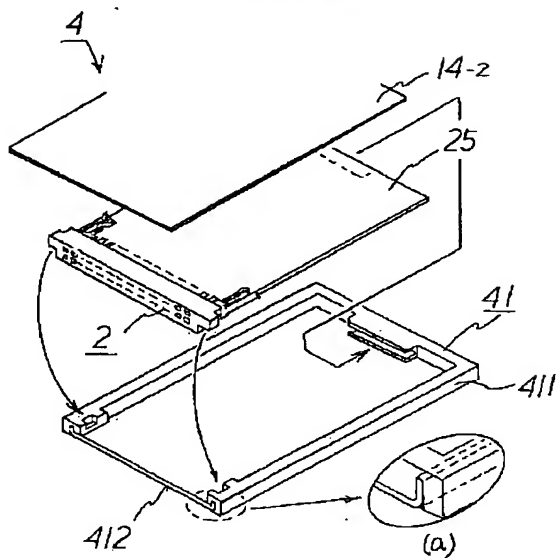
[Drawing 4]

メモ리카ードの構成例を説明する図



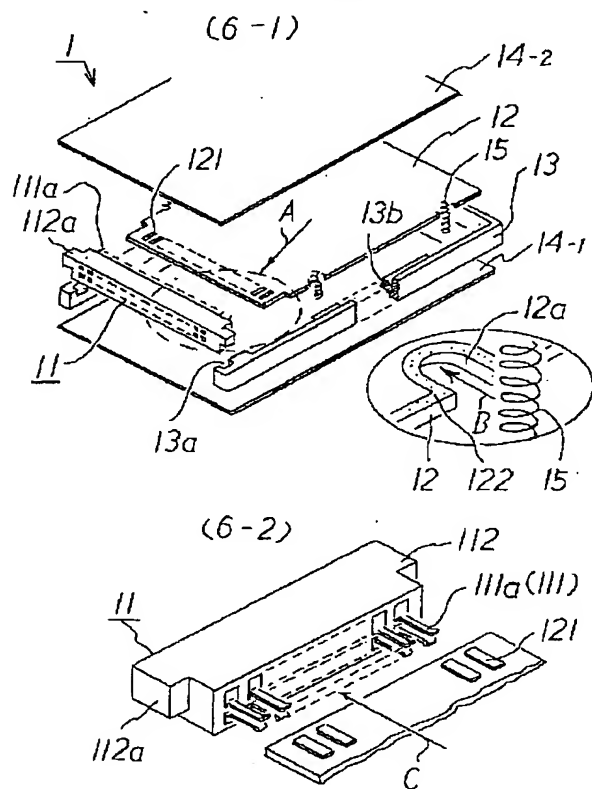
[Drawing 5]

メモ리카ードの他の構成例を説明する図



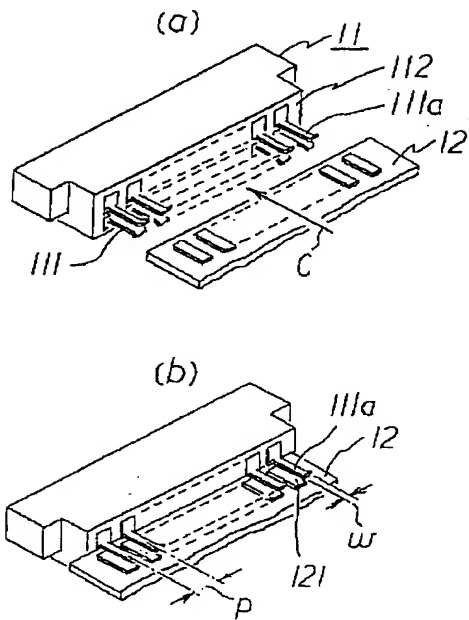
[Drawing 6]

従来のコネクタをメモ리카ードの構成と共に説明する図



[Drawing 7]

問題点を説明する図



[Translation done.]

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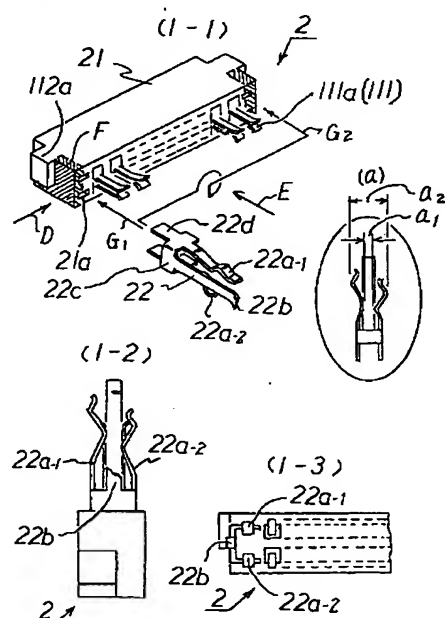
(54) 【発明の名称】 回路基板接続用コネクタとメモリカード

(57) 【要約】

【目的】 回路基板接続用コネクタに関し、回路基板接続時の該基板位置決めと接地短絡の容易化を実現して生産性向上を図ることを目的とする。

【構成】 回路基板の電極に接続されるコンタクトリード111aを一端とするジャック端子が、該リード111aを除く領域で絶縁体21に植設されてなる回路基板接続用コネクタであって、絶縁体21のコンタクトリード突出面のコンタクトリード配置域外側の長手方向両端部近傍に、前記回路基板面との接触で開離方向に変位し得る山形突起を備えた状態で対面する一対の第1の舌片 22a₁、22a₂と前記回路基板の電極形成域側辺との接触で該回路基板の幅方向位置を規定し得る第2の舌片22bとが、先端方向から見たときに“コ”字形になるように折り曲げ成形された位置決め接地端子22が、第2の舌片22bが上記回路基板の電極形成域側辺と接触し得る間隔を保ったまま該“コ”字形が対面するように植設して構成する。

本発明になるコネクタを主要部を中心として説明する図



【特許請求の範囲】

【請求項1】 回路基板の端部に整列して配置された電極に接続されるコンタクトリードを一端とするジャック端子が、絶縁体に植設されてなる回路基板接続用コネクタであって、

前記絶縁体のコンタクトリード突出面のコンタクトリード配置域外側の長手方向両端部近傍に、

前記回路基板面との接触で開離方向に変位し得る山形突起を備えた状態で対面する一対の第1の舌片と前記回路基板の電極形成域側辺との接触で該回路基板の幅方向位置を規定し得る第2の舌片とが一体成形された位置決め接地端子が、それぞれ植設されていることを特徴とする回路基板接続用コネクタ。

【請求項2】 コネクタに接続された回路基板と、接続一体化された該コネクタと回路基板をコネクタに設けた突起と回路基板周辺とでコネクタが外部装置と接続し得るように位置決めして保持する平面視“コ”字形の筐体と、該筐体両面に装着するシールド板とを少なくとも含むメモリカードであって、

回路基板の端部に整列して配置された電極に接続されるコンタクトリードを一端とするジャック端子が該コンタクトリードを除く領域で絶縁体に植設されてなる回路基板接続前の上記コネクタが、絶縁体のコンタクトリード突出面のコンタクトリード配置域外側の長手方向両端部近傍に、上記回路基板面との接触で開離方向に変位して前記シールド板と接触し得る山形突起を備えた状態で対面する一対の第1の舌片と前記回路基板の電極形成域側辺との接触で該回路基板の幅方向位置を規定し得る第2の舌片とが、先端方向から見たときに“コ”字形になるように折り曲げ成形された位置決め接地端子を、第2の舌片が上記回路基板の電極形成域側辺と接触し得る間隔を保ったまま該“コ”字形が対面するように植設されて構成され、

コネクタに接続される前の上記回路基板が、上記コネクタの第1の舌片と接触する領域に該回路基板上の回路に繋がる接地パターンを備えて形成されていることを特徴とするメモリカード。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は接地用端子を備えた回路基板接続用コネクタの構成と該コネクタを用いたメモリカードの構成に係り、特にコネクタに対する回路基板接続時の該基板位置決め容易化とメモリカードとしての接地短絡の確実化とを同時に実現して組立容易化による生産性向上を図った回路基板接続用コネクタとメモリカードに関する。

【0002】 電子技術の進展に伴って端末機器と装置本体間の情報をやり取りする一つ的手段としてこれらの端末機器や装置本体に着脱し得るメモリカードが普及し

つある。

【0003】そしてこの場合の該メモリカードには、複数のメモリ等半導体装置や電子デバイスが実装されて該メモリカード内に配置される回路基板を上記端末機器や装置本体に着脱せしめる必要から回路基板接続用コネクタ（以下文中では単にコネクタとする）が使用されているが、メモリカードとしての組立作業に工数がかかることとメモリカード表面板のグランド接続に特別な部品を要することから、如何に生産性を向上させるかが大きな課題となっている。

【0004】

【従来の技術】 図6は従来のコネクタをメモリカードの構成と共に説明する図であり、(6-1)はメモリカードとしての構成を示し (6-2)はコネクタの本発明に係わる主要部すなわち図の破線域を矢示A方向から見て示したものである。

【0005】また図7は問題点を説明する図である。図6の(6-1)でメモリカード1は、コネクタ11と、複数のメモリ等半導体装置や電子デバイスが実装された状態で該コネクタ11に接続される回路基板12、接続一体化した後の該コネクタ11と回路基板12とを位置決めして保持する筐体13、該筐体13の厚さ方向両面に接着等の手段で固定されるシールド板14₁、14₂、および上記回路基板12に組み込まれた状態で該回路基板12と2個のシールド板14₁、14₂間を導通せしめて接地電位に短絡する複数（図の場合では4個）のグランド接続用のコイルパネ15とで構成されている。

【0006】この内コネクタ11は、一端が上述した端末機器や装置本体に繋がるプラグ端子に嵌合し得る図示されないジャックコンタクトで他端が (6-2)で示す舌片状のコンタクトリード111aに形成されている複数のジャック端子111と、各該端子111を上記コンタクトリード111aを除く領域で日本電子工業振興協会（JEIDA）等の規格に基づく配置に整列して保持固定し得るように形成されている絶縁体112とで構成されており、上記ジャック端子111を該絶縁体112に挿入位置決めして保持固定することで図示のコネクタ11を組み立てることができる。

【0007】また図の(6-1)で、回路基板12のコネクタ11との接続部には、上記各コンタクトリード111aと対応する各位置に該基板上の図示されない回路に繋がるパッド電極121がパターン形成されている。

【0008】一方平面視“コ”字形をなす筐体13は、その開口側端部近傍の内側には上記絶縁体112の長手方向両端部に長手方向に突出する突起112aと嵌合して位置決めし得る凹み13aを備えていると共に周壁内側には上記回路基板12をその周辺の複数箇所保持するための突起13bを備えて形成されているものであり、接続一体化した上記コネクタ11と回路基板12とを上記凹み13aと突起13bとで一括して位置決め保持することができるように

なっている。

【0009】なお上述したグランド接続用のコイルパネ15は、円内拡大図(a)に示す如くそれぞれの間隔域を上記回路基板12の周辺近傍複数箇所(図では4箇所)に該基板12上の回路に繋がる接地パターン122を備えて形成されている半長円形凹み孔12aに矢印Bのように挿入することで、該回路基板12の接地電位に短絡させた状態で該基板12に保持させることができる。

【0010】そこで、図(6-2)の矢印Cのようにコネクタ11のコンタクトリード111a側に回路基板12を挿入し、各コンタクトリード111aとそれに対応する各パッド電極121とをはんだ接続した後、回路基板12の各半長円形凹み孔12aにコイルパネ15を保持させた状態で該コネクタ11と回路基板12とを上記筐体13に位置決めして保持せしめ、更に上記2個のシールド板14₁、14₂を該筐体13に固定して所要のメモリカード1を構成するようにしている。

【0011】かかる構成になるメモリカードでは、シールド板を取り外すだけで一体化されたコネクタと回路基板とが筐体から着脱し得るので、如何なる特性を持つメモリカードにも容易に変えられるメリットがある。

【0012】

【発明が解決しようとする課題】しかし、顧客のメモリカードとしての小型化要求や用途拡大に伴う端子増加要求等によってコンタクトリードの小型化、小ピッチ化が望まれるようになってきている。

【0013】図7(a)は一体化前のコネクタ11と回路基板12とを図6(b)と同様に示した図であり、図7(b)は不良状態を示した図である。図7(a)でコネクタ11のコンタクトリード111a側に回路基板12を矢印Cのように挿入すると、(b)に示すようにコンタクトリード111aと回路基板12のパッド電極121との間に位置ズレが発生することがある。

【0014】そしてこの場合の該位置ズレは、コンタクトリード111aの幅wの微細化やピッチpの微小化につれて隣接間での短絡を誘起し易くなる。従って従来の構成になるコネクタでは、回路基板と一体化せしめるための両者の位置合わせに多くの工数をかけざるを得ず、工数的な面からの生産性向上を期待することができないと言う問題があった。またメモリカードとしての組立時にも、回路基板とシールド板間の接地短絡用のコイルパネ15を装着しなければならず工数がかかると言う問題があった。

【0015】

【課題を解決するための手段】上記課題は、回路基板の端部に整列して配置された電極に接続されるコンタクトリードを一端とするジャック端子が、絶縁体に植設されてなる回路基板接続用コネクタであって、前記絶縁体のコンタクトリード突出面のコンタクトリード配置域外側の長手方向両端部近傍に、前記回路基板面との接触で開

離方向に変位し得る山形突起を備えた状態で対面する一対の第1の舌片と前記回路基板の電極形成域側辺との接触で該回路基板の幅方向位置を規定し得る第2の舌片とが一体化された位置決め接地端子が、それぞれ植設されている回路基板接続用コネクタによって解決される。

【0016】また、コネクタに接続された回路基板と、接続一体化された該コネクタと回路基板をコネクタに設けた突起と回路基板周辺とでコネクタが外部装置と接続し得るように位置決めして保持する平面視“コ”字形の筐体と、該筐体両面に装着するシールド板とを少なくとも含むメモリカードであって、回路基板の端部に整列して配置された電極に接続されるコンタクトリードを一端とするジャック端子が該コンタクトリードを除く領域で絶縁体に植設されてなる回路基板接続前の上記コネクタが、絶縁体のコンタクトリード突出面のコンタクトリード配置域外側の長手方向両端部近傍に、上記回路基板面との接触で開離方向に変位して前記シールド板と接触し得る山形突起を備えた状態で対面する一対の第1の舌片と前記回路基板の電極形成域側辺との接触で該回路基板の幅方向位置を規定し得る第2の舌片とが、先端方向から見たときに“コ”字形になるように折り曲げ成形された位置決め接地端子を、第2の舌片が上記回路基板の電極形成域側辺と接触し得る間隔を保ったまま該“コ”字形が対面するように植設されて構成され、コネクタに接続される前の上記回路基板が、上記コネクタの第1の舌片と接触する領域に該回路基板12上の回路に繋がる接地パターンを備えて形成されているメモリカードによって達成される。

【0017】

【作用】コネクタのコンタクトリード側端面に、回路基板位置決め用の舌片とシールド板間短絡用の舌片とを持つ接地用端子を付加すると、回路基板位置決めとシールド板間短絡とを同時に実現することができる。

【0018】そこで本発明では、対面する2個の第1の舌片と1個の第2の舌片とが各先端部から見た時に“コ”字形になるように一体化形成した2個の位置決め接地端子を、第2の舌片が対面するようにコネクタのコンタクトリード側端面の長手方向両端部近傍に付加してコネクタを構成するようにしている。

【0019】このことは、2個の該位置決め接地端子を回路基板位置決め用としての第2の舌片間隔が回路基板の幅に対応するようにコネクタに配置することで回路基板としての位置決めが実現し得ると共に、シールド板間短絡用としての第1の舌片間隔をシールド板間隔に対応させることで該シールド板間が短絡し得ることを示している。

【0020】従って、図6で使用したコイルパネを使用することなく、コネクタに対する回路基板の位置決めとシールド板間の短絡とを同時に実現することができて、生産性の向上を期待することができる。

【0021】

【実施例】図1は本発明になるコネクタを主要部を中心として説明する図であり、(1-1)は組立中の状態図、(1-2)は組立後の状態を矢印D方向から見た図、(1-3)は組立後の状態を矢印E方向から見た図である。

【0022】また図2は本発明のコネクタと回路基板の一体化工程を説明する図、図3は本発明を実現する位置決め接地端子の形成例を説明する図、図4はメモ리카ードの構成例を説明する図、図5はメモ리카ードの他の構成例を説明する図である。

【0023】なお図ではいずれも図6で説明したメモ리카ードに適用させる場合を例としているので、図6と同じ対象部材や部位には同一の記号を付すと共に重複する説明についてはそれを省略する。

【0024】図1の(1-1)で本発明になるコネクタ2は、図6で説明した複数のジャック端子111と、該各端子111を図6で説明したように所定の配置に整列して保持固定する絶縁体21と、本発明を実現する2個の位置決め接地端子22とからなる。

【0025】そしてこの場合の該絶縁体21は、図6の絶縁体112の突起112aを除く部分の長さを該突起高さを越えない高さ（図ではハッチング領域Fとして図示）で両側に延長させると共に、その延長領域に上記位置決め接地端子22を後述する突起22dの挿入で固定し得る大きさの接地端子固定穴21aを形成したものである。

【0026】また位置決め接地端子22は、対面する2個の第1の舌片22a₁、22a₂と1個の第2の舌片22bとが各先端部から見た時に“コ”字形になるように連結片22cに繋がった状態で折り曲げ成形されているものであり、連結片22cには上記絶縁体21の位置決め接地端子装着固定用の穴21aへの挿入で該絶縁体中心線上に固定される突起22dが形成されている。

【0027】なお、図6における回路基板12の装着を容易ならしめるためにそれぞれの長さを異ならせた上記第1の舌片22a₁と22a₂とは共に円内抽出図(a)に示すようにそれぞれの基部から一旦内側すなわち互いに接近する方向に撓められた後外側に突出する山形に曲げられて形成されており、初期の常態では最接近間隔a₁は少なくとも図6の回路基板12の厚さより小さくまた山頂間隔a₂は図6でのシールド板間隔すなわち筐体13の厚さ近傍になるように設定されている。

【0028】また第2の舌片22bの先端域は、上記回路基板12の装着を容易ならしめるために外側に曲げられている。そこで、2個の該各位置決め接地端子22の突起22dを矢印G₁、G₂のように上記絶縁体21の各接地端子固定穴21aに挿入して固定すると、第1の舌片22a₁、22a₂と第2の舌片22bとが配設されたコネクタ2を(1-2)および(1-3)に示すように構成することができるが、この時点で2個の該位置決め接地端子22で対面する第2の舌片22bは回路基板の幅方向位置を規制することになり、

また第1の舌片22a₁、22a₂は回路基板の厚さ方向を規制することとなる。

【0029】図1のコネクタに回路基板を接続する工程を示す図2で、(2-1)は接続前の分離した状態を、(2-2)は接続途中での状態を、また(2-3)は接続後の状態をそれぞれ示している。

【0030】図の(2-1)で、図1で説明したコネクタ2に対応する回路基板25は、図6で説明した回路基板12と等しいものであるが、各パッド電極121配置域の幅方向両サイド側辺25bの近傍にアース回路に繋がる接地パターン25aが追加して形成されているものである。

【0031】そこで該回路基板25を上記コネクタ2の各コンタクトリード111aと対応させて矢印Cのように接近させると、位置決め接地端子22の長い第2の舌片22bが先ず該基板25の両側辺25bと接触してその幅方向位置決めが実現するが、このことは該基板25の各パッド電極121とコネクタ2の各コンタクトリード111aとが位置合わせされることを示すと共に、該基板25の接地パターン25aとコネクタ2の第1の舌片22a₁、22a₂とが接触することを意味する。

【0032】そこで更に該回路基板25を押し込むと、上記位置決め接地端子22の第1の舌片22a₁、22a₂間の最接近間隔a₁が図1で説明したように該基板25の厚さより小さいため、該基板25のパッド形成面が該舌片22a₁、22a₂とに順次接触して外側に変位させるが、該舌片22a₁、22a₂間の初期の常態での山頂間隔a₂が図1で説明したように図5のシールド板間隔近傍になるように設定されているのでこの時点での山頂間隔a₁は一点鎖線で示すシールド板間隔を越えることとなる。

【0033】図(2-2)はこのときの状態を示している。その後該回路基板25を停止するまで押し込むことで(2-3)で示す状態になるが、上記第1の舌片22a₁、22a₂の変位は(2-2)の状態をほぼ維持させられるので、そのままコンタクトリード111とパッド電極121とを通常のはんだ付け技術等で両者を接続することで上記コネクタ2と該回路基板25とをアース接続を含めて一体化させることができる。

【0034】かかる一体化工程では、特に工数をかけてコネクタ2と回路基板25とを位置合わせすることなく該基板25の挿入のみで位置合わせし得るので、効率のよい一体化作業を実現することができる。

【0035】ここで図1および図2で説明した位置決め接地端子22の形成方法を図3で説明する。端子形成前のブランク形状を示した図3の(3-1)で、フープ材22'から通常のプレス技術等で打ち抜き成形されたブランク22'は、フープ材22'に沿う連結部22cに、片側の一方方向に突出する2個の突起22dと、該各突起22dに対応するそれぞれの位置から他方に突出する第1の舌片22a₁、22a₂、および該2個の舌片22a₁、22a₂の間から同方向に突出する第2の舌片22bとが繋がって形成されて

いるものである。

【0036】なお、この場合の第1の舌片 22a₁, 22a₂ と第2の舌片 22b とは上述した回路基板25の装着容易化を図るため、2個の第1の舌片 22a₁, 22a₂ はその片側例えば 22a₁ を他方の 22a₂ より短くすると共に第2の舌片 22b はこれら第1の舌片より更に長くするようにしている。

【0037】そこで通常の折り曲げ技術で、先ず第1の舌片 22a₁, 22a₂ のそれぞれを連結部 22c から予め設定した①～④の各位置で適当な角度の山折、谷折、山折、谷折を順次行い、また第2の舌片 22b はその先端近傍を適当な角度に谷折し、更に連結部 22c の第1の舌片 22a₁ と第2の舌片 22b との間および該第2の舌片 22b と第1の舌片 22b₂ との間を直角に山折することで、図1と図2で説明した所要の位置決め接地端子 22を(4-2)に示すように得ることができる。

【0038】図1のコネクタ2を使用したメモリカードとしての構成を例示説明する図4でメモリカード3は、コネクタ2と、図2で説明した回路基板25、接続一体化した後の該コネクタ2と回路基板25とを位置決めして保持する筐体 31、該筐体 31の厚さ方向両面に接着等の手段で固定されるシールド板 14₁, 14₂、とで構成されている。

【0039】そしてこの場合の筐体 31は、図6の筐体 13と同様に平面視“コ”字形をなすものであり、その開口側端部近傍の内側には上記コネクタ2を構成する絶縁体 21の突起 112aと嵌合する凹み 13a を備えていると共に周壁連結部はば中央の内側には上記回路基板25の周辺を厚さ方向で挟んで保持し得る溝付爪 31a を備えて形成されているものであり、上記コネクタ2に接続一体化されている回路基板25の先端側端部を矢印H₄のように上記溝付爪 31a に挿入せしめた後、矢印H₄, H₅のようにコネクタ2の上記突起 112aを該筐体 31の上記凹み 13a に落とし込むことで、該コネクタ2と回路基板25を一括して位置決め保持し得るようになっていく。

【0040】そこで、接続一体化されているコネクタ2と回路基板25とを上記方法で筐体 31に保持せしめた後図6同様に2個のシールド板 14₁, 14₂ を該筐体 31に固定すると、コネクタ2としての第1の舌片 22a₁, 22a₂ の山頂間隔a₃ が図2で説明したようにシールド板間隔を越えているため該第1の舌片 22a₁, 22a₂ が上記各シールド板 14₁, 14₂ の内面と接触することになり、結果的に回路基板25の接地パターン 122 と各シールド板 14₁, 14₂ とが短絡された所要のメモリカード3を構成することができる。

【0041】かかる構成になるメモリカード3では、従来のメモリカード1で必要としたグランド接続用のコイルパネ 15が不要なるため組立工数が削減し得るメリットがある。

【0042】メモリカードの他の構成例を示した図5で

メモリカード4は、コネクタ2と、回路基板25、接続一体化した該コネクタ2と回路基板25とを位置決めして保持する筐体 41、および該筐体 41に接着等の手段で固定されるシールド板 14₁ とで構成されている。

【0043】そして特にこの場合の該筐体 41は、図4で説明した筐体 31とその下面側に装着固定されるシールド板 14₁ とに対応する筐体 411 とシールド板 412 を、例えば抽出した円内拡大図(a)のように組み合わせた状態で一体成形して形成したものである。

10 【0044】従って、接続一体化されたコネクタ2と回路基板25とを図4の場合と同様に矢印H₄～H₅のように該筐体 41にセッティングした後、シールド板 14₁ を装着固定することで、図4同様に回路基板25の接地パターン 122 と各シールド板 14₁, 14₂ とが短絡された所要のメモリカード4を構成することができる。

【0045】なお上記説明になるジャックコネクタをプラグコネクタに代えても同様に構成することができ、かかる構成になるメモリカード4では、図4のメモリカード3よりも更に効率的に組み立てられるメリットがある。

【0046】

【発明の効果】上述の如く本発明により、コネクタに対する回路基板接続時の位置決め容易化とメモリカードとしての接地短絡の確実化とを同時に実現して組立容易化による生産性向上を図った回路基板接続用コネクタとメモリカードを提供することができる。

【0047】また本発明の説明では回路基板のパッド電極 121 が該基板の両面にありコンタクトリード 111 が該基板の両面ではんだ接続される場合を例としているが、30 上記パッド電極 121 が該基板の片面に配置され上記コンタクトリード 111 が該基板の片面で接続される場合でも同等の効果が得られることは明らかである。

【図面の簡単な説明】

【図1】 本発明になるコネクタを主要部を中心として説明する図。

【図2】 本発明のコネクタと回路基板の一体化工程を説明する図。

【図3】 本発明を実現する位置決め接地端子の形成例を説明する図。

40 【図4】 メモリカードの構成例を説明する図。

【図5】 メモリカードの他の構成例を説明する図。

【図6】 従来のコネクタをメモリカードの構成と共に説明する図。

【図7】 問題点を説明する図。

【符号の説明】

2 回路基板接続用コネクタ

3,4 メモリカード

13a 凹み

14₁, 14₂, 412 シールド板

50 21 絶縁体

21a 接地端子

固定穴

22'' フープ材
 22 位置決め接地端子
 第1の舌片
 22b 第2の舌片
 22d 突起
 25 回路基板

22' ブランク
 22a, 22a₁, 22a₂
 22c 連結片
 25a 接地バタ*

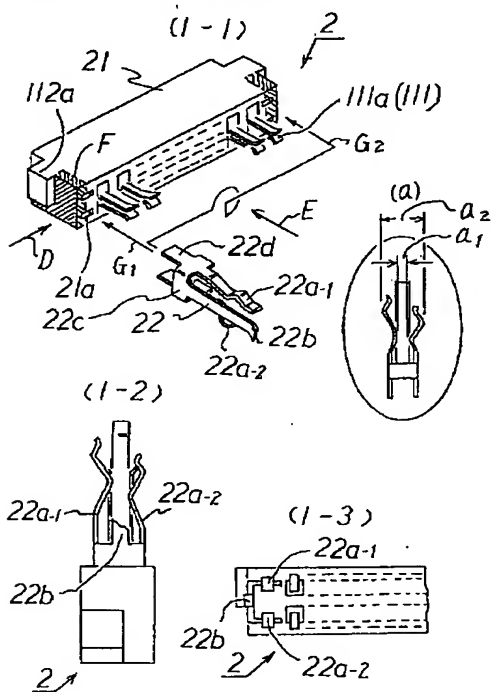
* ーン

25b 側辺
 31, 41, 411 筐体
 111 ジャック端子
 クトリード
 112a 突起
 121 電極(パッド電極)

31a 溝付爪
 111a コンタ

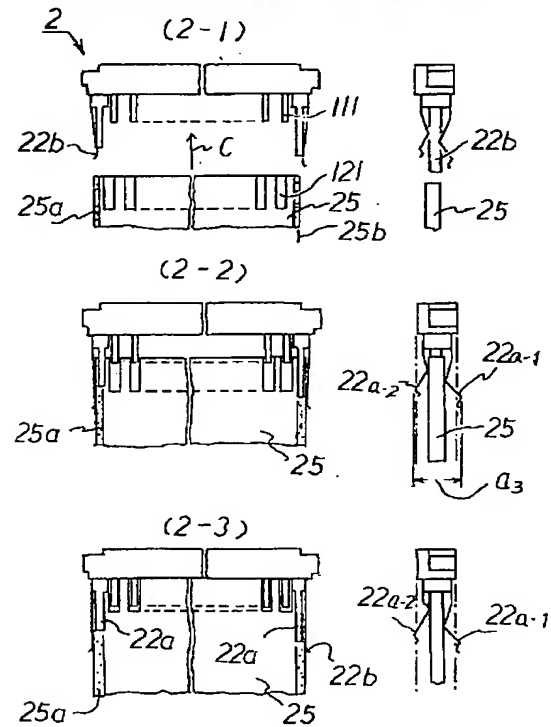
【図1】

本発明になるコネクタを主要部を中心として説明する図



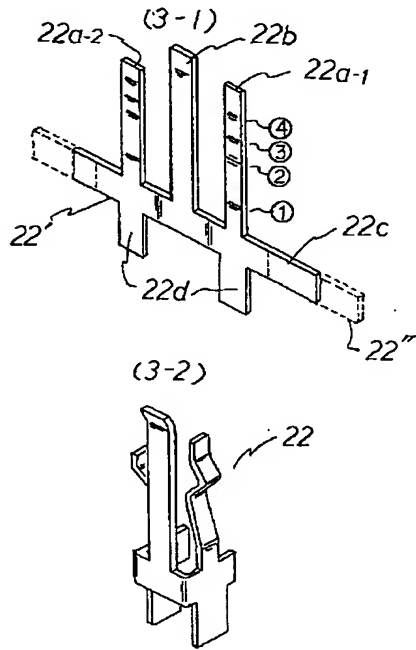
【図2】

本発明のコネクタと回路基板の一体化工程を説明する図



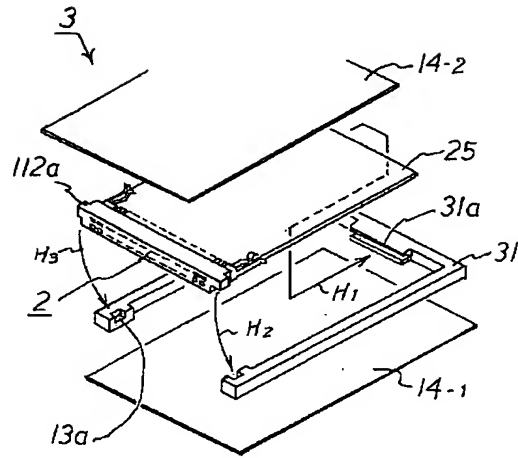
【図3】

本発明を実現する位置決め接地端子の形成例を説明する図



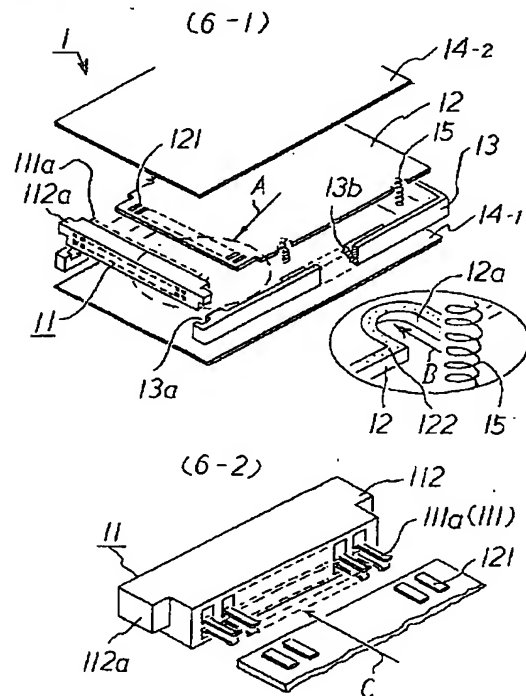
【図4】

メモリカードの構成例を説明する図



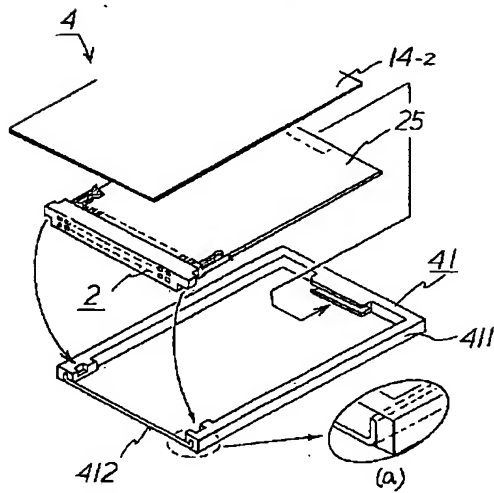
【図6】

従来のコネクタをメモリカードの構成と共に説明する図



【図5】

メモリカードの他の構成例を説明する図



【図 7】

問題点を説明する図

